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Business Communications Manager

Companion Configuration Guide

NORTEL NETWORKS

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Contents

Preface 9

Before you begin 9
Symbols used in this guide 9
Text conventions 10
How to get help 10

Chapter 1
Installing the Companion system 13

Companion components overview 14
Hardware installation process map 15
Remote power interconnect (RPI) unit overview 16
Mounting the RPI unit 17
Wiring the base station and connecting the RPI 19
Connecting the RPI 20
RPI output connections 21
RPI input connections 21
RPI-8 BIX wiring chart 22
RPI-8 BIX wiring chart 24
Companion base station installation overview 25
Positioning a Companion base station 26
Attaching a Companion base station 27
Installing the base station 27
Registering Companion telephones 29
Restarting the system after a software update 29
Installing external antennas and lightning surge protection 30
Read before you install equipment 30
Installing antennas (United States of America) 31
Before you install an outdoor antenna (USA) 31
Installing an outdoor antenna (USA) 32
Installing a lightning surge protector (USA) 34
Installing antennas (Canada) 35
Outdoor requirements 35
Installing an indoor directional antenna 36
Installing an indoor omnidirectional antenna (Canada) 37
Installing an outdoor omnidirectional antenna (Canada) 38
Installing a lightning surge protector (Canada) 40

Chapter 2
Configuring Companion handsets 41

Companion overview 42

Process map: Companion portable handset 43
Defining radio data 44
Using Reevaluation to assign cells to base stations 44
Programming base station radios 44
Defining base station cells 45
Enabling Companion handset registration 46
Enabling registration or changing the password 46
Using portable DNs to show handset status 47
Registering Companion portables 48
Registering the C3060 handset 48
Confirm that the handset is registered 49
Registering the C3050 handset 50
Confirm that the handset is registered 51
Registering a C3020 handset (Canada only) 52
Confirm that the handset is registered 52
Deregistering a handset 53
Deregistering a portable from the system 53
Deregistering a C3060 handset 54
Deregistering a C3050 handset 54
Deregistering a C3020 handset 55
Measuring RSSI for the handsets 55
Measuring undirected RSSI for C3060 handsets 56
Measuring directed RSSI for C3060 handsets 56
Measuring undirected RSSI for C3050 handsets 57
Measuring directed RSSI for C3050 handsets 57
Measuring undirected RSSI for C3020 handsets 58
Measuring directed RSSI for C3020 handsets 58
Companion DN record parameters 59
Handset features and restrictions 60
Feature access for Companion 61
Language selection 62
Index 63

Figures

Figure 1 Process map: Installing Companion support hardware 15
Figure 2 RPI unit 16
Figure 3 RPI mounting holes 17
Figure 4 Opening the RPI cover 18
Figure 5 RPI components 18
Figure 6 RPI connector printed-circuit board 20
Figure 7 Output connector pinout 21
Figure 8 Input connector pinout 21
Figure 9 Bracket termination board 27
Figure 10 Slide the cover on bracket 28
Figure 11 Installed antenna and lightning surge protectors (USA) 31
Figure 12 Antenna with antenna bracket (USA) 33
Figure 13 Lightning surge protector and bracket (USA) 34
Figure 14 Indoor directional external antenna (Canada) 36
Figure 15 Indoor omnidirectional external antenna (Canada) 37
Figure 16 Install the outdoor omnidirectional external antenna (Canada) 39
Figure 17 Install the lightning surge protector (Canada) 40
Figure 18 Companion headings 41
Figure 19 Process map: Setting up Companion handsets for registration 43

Tables

Table 1 RPI Requirements 17
Table 2 Cable distances 19
Table 3 Input wiring 22
Table 4 RPI-8 BIX wiring chart 22
Table 5 RPI-16 BIX wiring chart 24
Table 6 Minimum distance between office areas and base stations 26
Table 7 Clearance for the base stations 27
Table 8 UTAM messages 29
Table 9 Radio settings 44
Table 10 Cell information 45
Table 11 Handset registration and password information 46
Table 12 Companion telephone programming 59
Table 13 Features available to a Companion portable handset 61

Preface

This guide explains how to install and program Companion base stations and handsets.

Before you begin

This guide assumes the following:

- The Business Communications Manager is installed and initialized, and all hardware appears to be working.
- That a site survey has been conducted and the installer has access to these plans.
- That all configuration operators have a working knowledge of the Windows operating system and graphical user interfaces.

Symbols used in this guide

This guide uses symbols to draw your attention to important information. The following symbols appear in this guide:

Caution: Caution Symbol
Alerts you to conditions where you can damage the equipment.

Danger: Electrical Shock Hazard Symbol
Alerts you to conditions where you can get an electrical shock.

Warning: Warning Symbol
Alerts you to conditions where you can cause the system to fail or work improperly.

Note: Note Symbol
A Note alerts you to important information.

Tip: Tip Symbol
Alerts you to additional information that can help you perform a task.

Security Note: This symbol indicates a point of system security where a default should be changed, or where the administrator needs to make a decision about the level of security required for the system.

Text conventions

This guide uses the following text conventions:

angle brackets (< >)	Indicates that you choose the text to enter based on the description inside the brackets. Do not type the brackets when entering the command. Example: If the command syntax is: **`ping`** *`<ip_address>`* you enter: **`ping 192.32.10.12`**
`bold Courier text`	Indicates command names and options and text that you need to enter. Example: Use the **`dinfo`** command. Example: Enter **`show ip`** {**`alerts`**|**`routes`**}.
italic text	Indicates book titles
`plain Courier text`	Indicates command syntax and system output, for example, prompts and system messages. Example: `Set Trap Monitor Filters`
FEATURE **HOLD** **RELEASE**	Indicates that you press the button with the coordinating icon on whichever set you are using.

How to get help

If you do not see an appropriate number in this list, go to *www.Nortelnetworks.com/support*.

USA and Canada

Authorized Distributors - ITAS Technical Support

Telephone: 1-800-4NORTEL (1-800-466-7835)
If you already have a PIN Code, you can enter Express Routing Code (ERC) 196#.
If you do not yet have a PIN Code, or for general questions and first line support, you can enter ERC 338#.

Website: http://www.nortelnetworks.com/support

Presales Support (CSAN)

Telephone: 1-800-4NORTEL (1-800-466-7835)
Use Express Routing Code (ERC) 1063#

EMEA (Europe, Middle East, Africa)

Technical Support - CTAS

Telephone:

* European Freephone	00800 800 89009
European Alternative/ United Kingdom	+44 (0)870-907-9009
Africa	+27-11-808-4000
Israel	800-945-9779

* Note: Calls are not free from all countries in Europe, Middle East or Africa

Fax: 44-191-555-7980

email: emeahelp@nortelnetworks.com

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Technical Support - CTAS

Telephone: 1-954-858-7777

email: csrmgmt@nortelnetworks.com

APAC (Asia Pacific)

Technical Support - CTAS

Telephone: +61-2-870-8800

Fax: +61 388664644

email: asia_support@nortelnetworks.com

In-country toll free numbers

Australia 1800NORTEL (1800-667-835)

China 010-6510-7770

India 011-5154-2210

Indonesia 0018-036-1004

Japan 0120-332-533

Malaysia 1800-805-380

New Zealand 0800-449-716

Philippines 1800-1611-0063

Singapore 800-616-2004

South Korea 0079-8611-2001

Taiwan 0800-810-500

Thailand 001-800-611-3007

Service Business Centre & Pre-Sales Help Desk +61-2-8870-5511

Chapter 1
Installing the Companion system

This section describes the process for installing a Companion wireless system.

The following information is based on the following understandings:

- A site survey has been completed and you have determined the exact locations of the base stations around your site.
- You have determined how many handsets you want.
  To determine this, you need to know whether your system has a DS30 channel 2/6 or 3/5 split.
- The Companion requires a DSM8 module for every 32 handsets. You can assign a maximum of 32 Companion handsets per DSM because the Companion system can use both B channels. You can install a maximum of two DSM8s or one DSM32 for Companion handsets, per system, providing your system is configured with a DS30 channel 2/6 split. Refer to the *Business Communications Manager Installation and Maintenance Guide* for detailed hardware configuration.

The Companion hardware must be in place and configured before you can use the handsets to connect to the Business Communications Manager. This section describes the installation of the various pieces of hardware.

This section contains the following information:

- "Companion components overview" on page 14
- "Hardware installation process map" on page 15
- "Companion components overview" on page 14
- "Remote power interconnect (RPI) unit overview" on page 16
- "Mounting the RPI unit" on page 17
- "Wiring the base station and connecting the RPI" on page 19
- "Companion base station installation overview" on page 25
- "Positioning a Companion base station" on page 26
- "Attaching a Companion base station" on page 27
- "Installing external antennas and lightning surge protection" on page 30

Companion components overview

Your Companion portable telephone allows you to leave your desk without missing telephone calls. The telephones can access most Business Communications Manager business features such as call forward, call transfer, voice conference, and voice messaging using feature codes.

Business Communications Manager Companion has four main components:

Software - Companion software manages the telephone traffic between Companion base stations and portable telephones. Base stations connect to the Business Communications Manager in the same way that Business Communications Manager telephones do. You register the Companion portable telephones on the system. They do not require any ports on the system. You can connect a maximum of 60 portable telephones and a maximum of 32 base stations (32 cells) to the system.

Note: If you choose a 3/5 channel split for your system, you cannot assign a module to channel 7. This limits you to a maximum of 16 base stations, which can support a maximum of 30 handsets.

Companion base stations — Position the base stations around the coverage area to send and receive calls between the portable telephones and Business Communications Manager. Base stations use digital radio technology and support handoff and roaming within the coverage area. The coverage area can be a maximum of 160,000 square meters (1,700,000 square feet) when using the maximum number of base stations. The base station can use internal or external antennas. For most installations, the internal antenna will be used. If you need to install external antennas, refer to “Installing external antennas and lightning surge protection” on page 30.

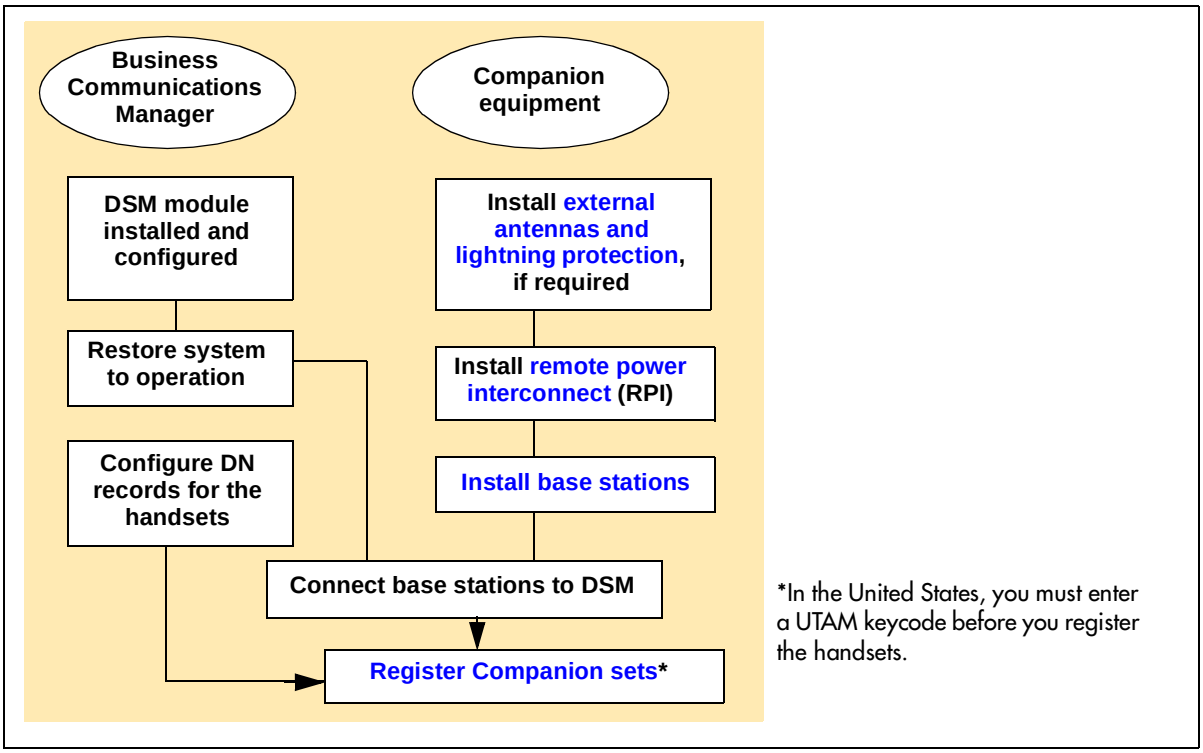
Companion wireless handsets — Business Communications Manager supports the following wireless handsets: Companion 3020, Companion C3050 Etiquette, Companion C3050 CT2Plus, and Companion C3060.
The portable telephones used with your Business Communications Manager system are small, lightweight units with complete digital performance to provide clear voice quality. Companion portable telephones feature a three-line, 16-character, alphanumeric display.

Administration and maintenance tools — Programming of the Companion system is easily and quickly done through the Business Communications Manager Unified Manager. You can assign portable telephones to the system, check base station parameters, and enable and disable registration through programming.
Companion Diagnostics software allows you to run diagnostics on the wireless system. You run the diagnostics using a personal computer located at the customer site or in a remote location.

Hardware installation process map

The following figure provides an overview of the process for installing the support hardware for a Companion wireless system.

Figure 1 Process map: Installing Companion support hardware

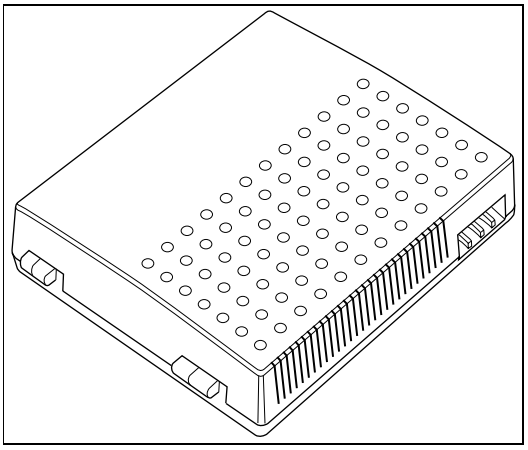

Business Communications Manager
Companion equipment
DSM module installed and configured
Install external antennas and lightning protection, if required
Restore system to operation
Install remote power interconnect (RPI)
Configure DN records for the handsets
Install base stations
Connect base stations to DSM
Register Companion sets*
*In the United States, you must enter a UTAM keycode before you register the handsets.

Note: Companion wireless availability is region-specific. This option also requires a software keycode for activation.

Remote power interconnect (RPI) unit overview

The remote power interconnect unit (RPI) provides remote power for base station support. The following figure shows a diagram of the RPI.

Figure 2 RPI unit



Caution: The RPI unit must have the DC backup power supplied by a UL listed universal power supply (UPS).
The UPS must have an output voltage rating of 44 to 52 V DC, with a maximum fault current limit of 6 A to protect the RPI output wiring. If these requirements are not met, it is necessary to use class 1 wiring.

Warning: You must install the RPI units inside a building.
The AC outlet powering the RPI must be installed near the equipment and must be easily accessible.
The length of the RPI cord, from the outside surface of the unit to the plug, must be a minimum of 1.3 m (4.5 ft) and a maximum of 4.6 m (15 ft).

There are two versions of the RPI unit:

- The RPI-8 BIX UL supports a maximum of eight base stations.
- The RPI-16 BIX UL supports a maximum of 16 base stations.

Each RPI has a connection printed-circuit board and either one (RPI-8 BIX UL) or two (RPI-16 BIX UL) power supply units (PSUs). The maximum input power consumption of an RPI is 240 W. If you use a UPS 48 V dc backup source, the maximum input power requirement of the RPI is 140 W.

You can upgrade an RPI-8 BIX UL to an RPI-16 BIX UL by installing a second PSU to the RPI-8 BIX UL.

If you distribute the RPIs around the site, the number and type of RPIs depend on where you place them and how you power the base stations.

To determine how many base stations and how many PSUs you need for the number of base stations, use the following table:

Table 1 RPI Requirements

Base stations	RPI-16 and RPI-8 required	PSUs required
1–8	1 RPI-8	1 PSU
9–16	1 RPI-16	2 PSUs
17–24	1 RPI-16 and 1 RPI-8	3 PSUs
25–32	2 RPI-16	4 PSUs

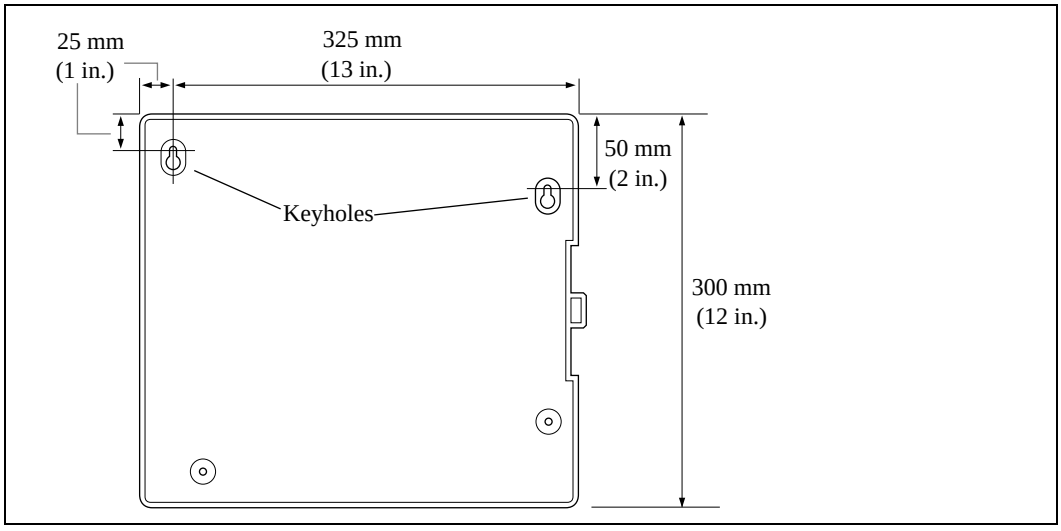
Mounting the RPI unit

When you mount the RPI unit, ensure you are following these guidelines before you start with step 1 below:

- Leave a clearance of a minimum of 125 mm (5 in.) around the RPI to provide acceptable ventilation and to prevent overheating.
- Leave a clearance of a minimum of 300 mm (12 in.) between two RPIs if you are installing them above one another, to provide acceptable ventilation and to prevent overheating.
- Install RPIs a minimum of 300 mm (12 in.) from the ceiling.

1 Partially screw in two #10 50 mm (2 in.) screws using the keyholes in the back of the unit, at the top, as a guide. Refer to the following figure.

Figure 3 RPI mounting holes

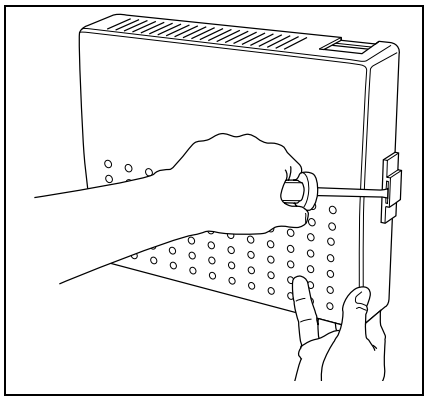


2 Open the cover with a screwdriver.

a On the latch on the right side of the unit, use the screwdriver to push in, and then down, to release the latch.

b Remove the cover by lifting it up. Refer to the following figure.

Figure 4 Opening the RPI cover



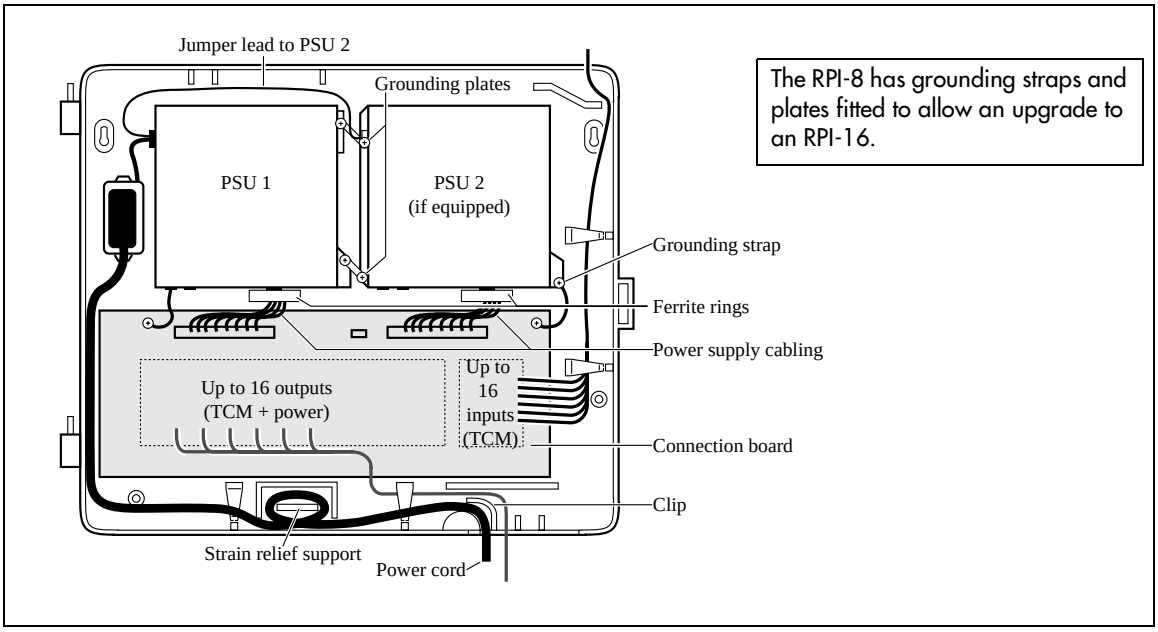
3 Hang the RPI on the two screws and tighten the screws.

4 Install the remaining two screws.

5 Feed the power cord through the bottom of the RPI.

6 Route it through the clip and around the strain relief support. The following figure shows how to route the power cord.

Figure 5 RPI components



7 Route the power cord to the input power socket just to the left of PSU 1, on the left.

8 Connect the plug to the socket.

9 Follow the appropriate wiring instructions in the wiring charts in the next section, "Wiring the base station and connecting the RPI".

CAUTION: Do not apply power to the RPI until its installation and wiring are complete.

10 After the cable is wired correctly, connect the RPI power cord to the ac outlet.

11 Label each RPI.

Wiring the base station and connecting the RPI

The maximum two-way DC loop resistance for power pairs, including interconnections for each base station, is 75 ohms. You need one or two power pairs between the RPI and the base station. The number of power pairs depends on the wire size of the power pair and the distance between the base station and the RPI.

This section contains this information:

- "Connecting the RPI" on page 20
- "RPI output connections" on page 21
- "RPI input connections" on page 21
- "RPI-8 BIX wiring chart" on page 22
- "RPI-8 BIX wiring chart" on page 24

Caution: Do not run unprotected power cables outdoors.

The maximum cable distances allowed between the RPI and the base station depend on the size of wire you use. Refer to the following table.

Table 2 Cable distances

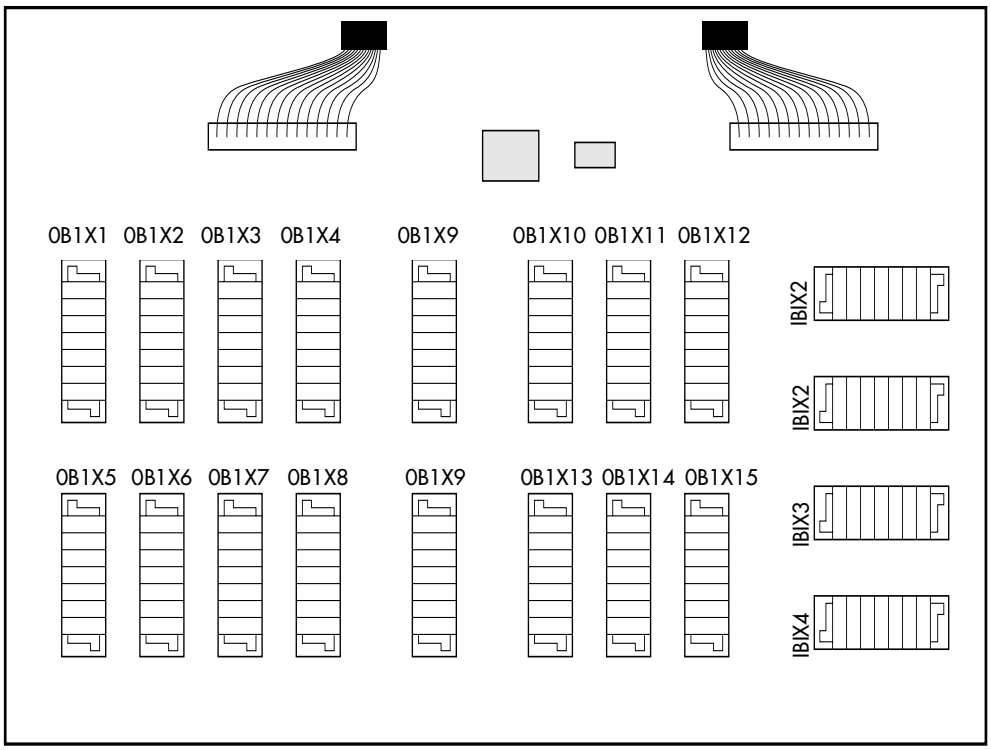
Wire size	Single pair	Double pair
0.6 mm (22 AWG)	800 m (2,500 ft.)	1200 m (4,000 ft.)
0.5 mm (24 AWG)	500 m (1,500 ft.)	1000 m (3,000 ft.)

Caution: When you use two power pairs, connect both pairs with the same polarity.

Connecting the RPI

Connect the power pairs to the correct connectors. The following figure shows the location of the input and output connectors on the RPI connector printed-circuit board.

Figure 6 RPI connector printed-circuit board

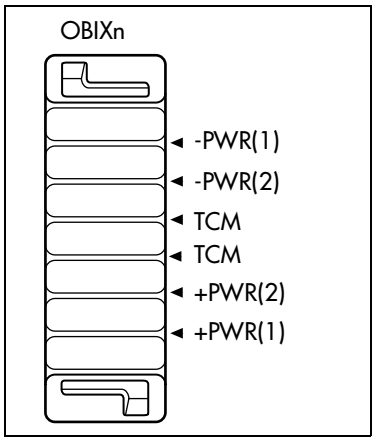


RPI output connections

Feed the output pairs in through the bottom of the RPI and route the pairs to the output connectors. The following figure shows how to route the output pairs. If you use one pair to power a base station, connect the power pair to -PWR(1) and +PWR(1). If you use two pairs to power a base station, connect one pair to -PWR(1) and +PWR(1), and the second pair to -PWR(2) and +PWR(2).

Caution: Ensure both pairs have the same polarity.
If you connect two power pairs with opposite polarities, you can damage the base station and RPI.

Figure 7 Output connector pinout

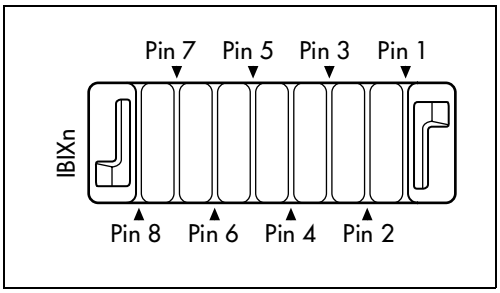


RPI input connections

Feed the TCM input pairs from the Business Communications Manager distribution frame through the top of the RPI and route them to the input connectors (IBIX1 to IBIX4).

The following figure shows how to route the input pairs. The maximum number of input pairs in an RPI installation is 16.

Figure 8 Input connector pinout



The table below lists the pinout and signal references.

Table 3 Input wiring

Connector	Pin	Signal	Output connector
IBIX1	1, 2	TCM 1	OBIX1
	3, 4	TCM 2	OBIX2
	5, 6	TCM 3	OBIX3
	7, 8	TCM 4	OBIX4
IBIX2	1, 2	TCM 5	OBIX5
	3, 4	TCM 6	OBIX6
	5, 6	TCM 7	OBIX7
	7, 8	TCM 8	OBIX8
IBIX3	1, 2	TCM 9	OBIX9
	3, 4	TCM 10	OBIX10
	5, 6	TCM 11	OBIX11
	7, 8	TCM 12	OBIX12
IBIX4	1, 2	TCM 13	OBIX13
	3, 4	TCM 14	OBIX14
	5, 6	TCM 15	OBIX15
	7, 8	TCM 16	OBIX16

RPI-8 BIX wiring chart

The following table lists the wiring chart for the RPI-8 BIX.

Table 4 RPI-8 BIX wiring chart

Pin	RPI Connector printed-circuit board	Label	Wire color
26	OBIX1 BS1	-PWR	White-Blue
1			Blue-White
27		TCM	White-Orange
2			Orange-White
28		+PWR	White-Green
3			Green-White
29	OBIX2 BS2	-PWR	White-Brown
4			Brown-White
30		TCM	White-Slate
5			Slate-White
31		+PWR	Red-Blue
6			Blue-Red

Table 4 RPI-8 BIX wiring chart (Continued)

Pin	RPI Connector printed-circuit board	Label	Wire color
32	OBIX3 BS3	-PWR	Red-Orange
7			Orange-Red
33		TCM	Red-Green
8			Green-Red
34		+PWR	Red-Brown
9			Brown-Red
35	OBIX4 BS4	-PWR	Red-Slate
10			Slate-Red
36		TCM	Black-Blue
11			Blue-Black
37		+PWR	Black-Orange
12			Orange-Black
38	OBIX5 BS5	-PWR	Black-Green
13			Green-Black
39		TCM	Black-Brown
14			Brown-Black
40		+PWR	Black-Slate
15			Slate-Black
41	OBIX6 BS6	-PWR	Yellow-Blue
16			Blue-Yellow
42		TCM	Yellow-Orange
17			Orange-Yellow
43		+PWR	Yellow-Green
18			Green-Yellow
44	OBIX7 BS7	-PWR	Yellow-Brown
19			Brown-Yellow
45		TCM	Yellow-Slate
20			Slate-Yellow
46		+PWR	Violet-Blue
21			Blue-Violet
47	OBIX8 BS8	-PWR	Violet-Orange
22			Orange-Violet
48		TCM	Violet-Green
23			Green-Violet
49		+PWR	Violet-Brown
24			Brown-Violet

RPI-8 BIX wiring chart

The following table lists the wiring chart for the RPI-16 BIX.

Table 5 RPI-16 BIX wiring chart

Pin	RPI Connector printed-circuit board	Label	Wire color
26	OBIX9 BS9	-PWR	White-Blue
1			Blue-White
27		TCM	White-Orange
2			Orange-White
28		+PWR	White-Green
3			Green-White
29	OBIX10 BS10	-PWR	White-Brown
4			Brown-White
30		TCM	White-Slate
5			Slate-White
31		+PWR	Red-Blue
6			Blue-Red
32	OBIX11 BS11	-PWR	Red-Orange
7			Orange-Red
33		TCM	Red-Green
8			Green-Red
34		+PWR	Red-Brown
9			Brown-Red
35	OBIX12 BS12	-PWR	Red-Slate
10			Slate-Red
36		TCM	Black-Blue
11			Blue-Black
37		+PWR	Black-Orange
12			Orange-Black
38	OBIX13 BS13	-PWR	Black-Green
13			Green-Black
39		TCM	Black-Brown
14			Brown-Black
40		+PWR	Black-Slate
15			Slate-Black

Table 5 RPI-16 BIX wiring chart (Continued)

Pin	RPI Connector printed-circuit board	Label	Wire color
41	OBIX14 BS14	-PWR	Yellow-Blue
16			Blue-Yellow
42		TCM	Yellow-Orange
17			Orange-Yellow
43		+PWR	Yellow-Green
18			Green-Yellow
44	OBIX15 BS15	-PWR	Yellow-Brown
19			Brown-Yellow
45		TCM	Yellow-Slate
20			Slate-Yellow
46		+PWR	Violet-Blue
21			Blue-Violet
47	OBIX16 BS16	-PWR	Violet-Orange
22			Orange-Violet
48		TCM	Violet-Green
23			Green-Violet
49		+PWR	Violet-Brown
24			Brown-Violet

Companion base station installation overview

Before you install portable equipment, ensure that a site planner determines base station locations and records the base station information in a provisioning record.

This section includes the detailed information about:

- “Positioning a Companion base station” on page 26
- “Attaching a Companion base station” on page 27
- “Installing the base station” on page 27

Caution: You must install all base stations within 1230 m (4000 ft., TCM wiring length) of the BCM1000 or base station module.
To optimize seamless hand off, the difference in TCM wiring length between neighboring base stations must not exceed 300 m (1,000 ft.).

Before you install or move wireless equipment in the United States, check that you have approval from UTAM Inc.

The United States FCC has appointed UTAM Inc. as the body responsible for coordinating and verifying the installation or relocation of unlicensed, personal wireless communication devices. To

comply with UTAM Inc., the system uses keys and credits to control user capacity and to ensure system location verification. You require these software keys and credits to activate Companion services. You purchase these credits at the time you place the order.

Positioning a Companion base station

Avoid installing base stations on large concrete or marble columns because these columns affect radio coverage. If possible, place the base station a minimum of 1 m (40 in.) from these types of columns. Do not install a base station with the antenna housings near metal objects. Be careful not to damage existing wiring or panels.

Do not position base stations in ducts, plenums, or hollow spaces used to transport environmental air except where the duct, plenum or hollow space is created by a suspended ceiling having lay-in panels. When you need more than one base station in a cell to meet traffic requirements, position the base stations at the same cell center.

To place all base stations in the same cell center:

- for the USA, a minimum of 54 in. and a maximum of 9 ft. 9 in. distance between the center of one base station to the center of another
- for Canada, a minimum of 9 cm and a maximum of 1.5 m distance from edge to edge

Warning: Never install base stations in rows.

Position base stations away from office areas or areas with high portable telephone traffic. The table below shows the minimum distance between office areas and base stations. Install the base station on the ceiling or high on walls to maintain these minimum distances.

Table 6 Minimum distance between office areas and base stations

Number of base stations in the cell	Minimum distance between office areas and base stations
1	1 m (40 in.)
2	1.4 m (56 in.)
3	1.8 m (72 in.)
4	2 m (80 in.)

Attaching a Companion base station

Install base stations on a wall or on a ceiling. When installing base stations on a wall, install them with their covers at the bottom, as shown in the figure below. Allow for clearances around the base station as indicated in the following table.

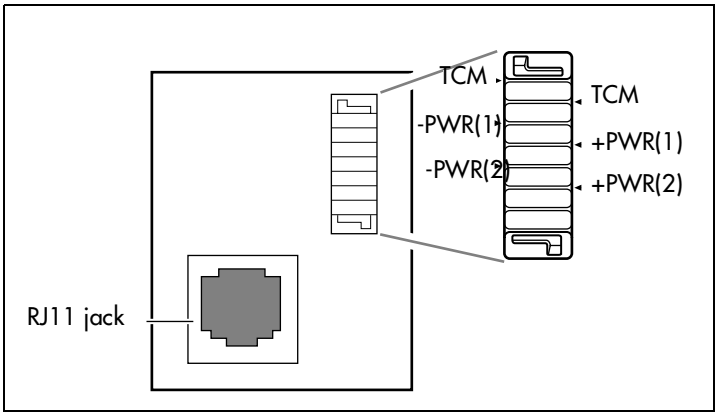
Table 7 Clearance for the base stations

Clearance conditions	Canada	USA
Clearance from all other objects	9 cm	3.5 in.
Vertical clearance from base station center to base station center	27 cm	54 in.
Horizontal clearance from base station center to base station center	41 cm	54 in.

Installing the base station

1. Fasten the bracket into position using two #8 38-mm (1-1/2 in.) screws.
2. Route the cable from the BCM1000 through the top or bottom opening.
3. Wind any excess cable around the posts, then fasten the cable under the strain relief.
4. Connect the wires to the BIX connector on the bracket termination board as shown in the following figure.

Figure 9 Bracket termination board



The polarity of the TCM connections is not important. If you connect the two power pairs to the bracket terminal board of the base station, you must connect the power pairs with the same polarity.

CAUTION: Ensure that the RPI is off before connecting power pairs to the base station.

5. Install the base station on the bracket. Snap it into position.
6. Connect the power RJ-11 jumper lead to the RJ-11 jacks on the termination board and the base station.

7 For plug top power supplies only, connect the power supply connector to the base station power connector. Make sure the base station uses a class 2 plug top power source only.

CAUTION: If you insert the power supply connector in the wrong direction, you can damage the plug top power supply and the base stations.
Position the power supply connector in the correct direction and push it into place.

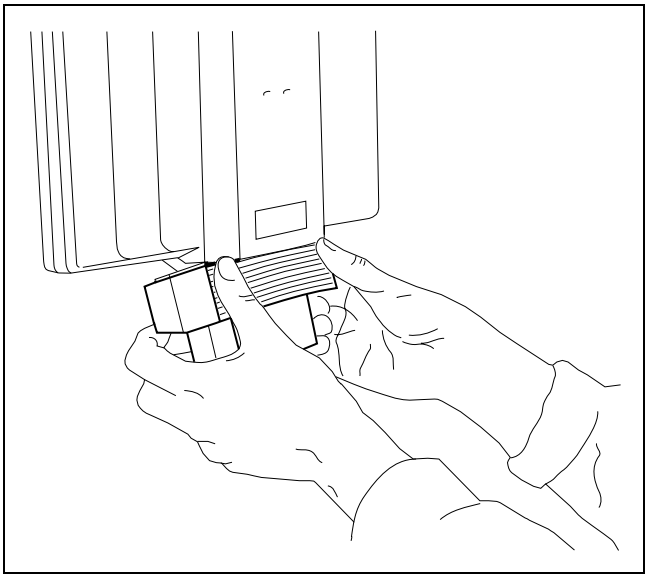
8 In the space provided on the label attached to the lower right corner of the mounting bracket, record the port number used.

Include the marking information for all of the base stations on the completed installation floor plans.

9 Slide the cover on the bracket, using the guide to position it correctly. Refer to the following figure.

10 Snap it into place.

Figure 10 Slide the cover on bracket



Registering Companion telephones

To use Companion portable telephones, you must first install radio base stations to transmit and receive radio signals to and from the portable telephones. See "Companion base station installation overview" on page 25.

You use a different method to install portable telephones than desktop telephones. There are no direct connections between the portable telephones and the system.

Do the following:

- Install the batteries and battery charging units for each portable, using the instructions that come with the portable.
- Enter the software keys for Companion in the Business Communications Manager Unified Manager under **Software** keys
- Register every Companion portable for use with the system.

Note: You must register a portable telephone before you can use it. By default, Companion portable telephones are not assigned extension numbers. The range of portable extensions available for wireless registration is 565 to 596. For more information about registering and programming Companion portables, refer to "Configuring Companion handsets" on page 41.

Restarting the system after a software update

If you added a base station that requires a software update, the system begins downloading the software to the base station. The display shows **`BS-1 Dload Start`**.

1. Press **`CLEAR`** to clear the message. When the base station software finishes downloading, the **`BS-1 Dload Done`** appears.
2. Press **`CLEAR`** to clear the message. Some base stations do not power up at the same time, and this message repeats at the beginning of each download.

In the United States, after restarting, the display shows one of the messages listed in the following table:

Table 8 UTAM messages

If display shows	See
UTAM code req'd	System logical identifier (LID) information
UTAM test failed	See alarm codes in the Windows NT event log.

Warning: A loss of unlicensed transition and management for microwave (UTAM) information occurs when upgrading US Business Communications Manager systems. You need UTAM Recovery Codes.

Installing external antennas and lightning surge protection

You can use external antennas to provide a broad range for your Companion system. Ensure that any external installations comply with local regulations and include lightning surge protection.

This section contains the following procedures:

- "Installing antennas (United States of America)" on page 31
- "Installing a lightning surge protector (USA)" on page 34
- "Installing antennas (Canada)" on page 35

Read before you install equipment

- You must install the antenna vertically. Refer to "Before you install an outdoor antenna (USA)" on page 31.
- Use #8, 12 mm to 50 mm ($^1/_2$ in. to 2 in.) screws to install the antenna bracket and lightning surge protector bracket to the wall.
- Always ensure that the antenna is clear of any adjacent obstruction or metal objects. If you use more than one external antenna at a cell center, separate the antennas at by least 1 m (40 in.) to avoid radio interference problems.
- When running the coaxial cable inside or outside, be careful not to damage the cable. Damage to the cable affects its performance. The minimum recommended bending radius is 200 mm (8 in.).
- The coaxial cable length must not exceed 10 m (33 ft).
- Use RG-58AU coaxial cables to connect the antennas to the base stations.
- You can attach a proprietary extension cable between the lightning surge protector and the antenna or between the lightning surge protector and the base station. Make sure you keep the total cable length as short as possible and use only the recommended extension cable when necessary.
- You must install a lightning surge protector for each external antenna.

Warning: FCC requirements.
In the United States, the FCC requires that you connect only approved antennas to Companion base stations.

Caution: Do not install the outdoor antenna or the lightning surge protector during an electrical storm.
Always turn off the base station power before connecting the coaxial cable of an outdoor antenna.
Always install the lightning surge protector at the cable entry point into the building. Connect the lightning surge protector to ground before you connect the coaxial cable.

Installing antennas (United States of America)

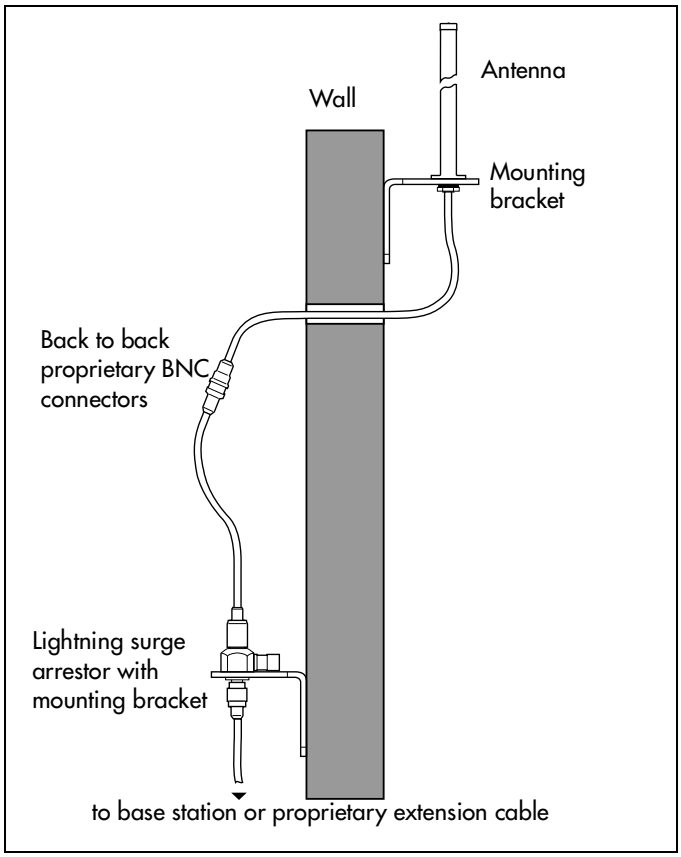
The following points cover special information about installations in the United States of America.

- The outdoor antenna connectors on the base station are special proprietary BNC connectors. Refer to "Before you install an outdoor antenna (USA)" on page 31 and "Installing an outdoor antenna (USA)" on page 32.
- Antennas are supplied with cables attached and terminated with special proprietary BNC plugs to join with the connector on the base station. Refer to "Installing an indoor directional antenna" on page 36.
- Cables are not supplied with outdoor antennas.
- You must also install lighting surge protection on outside antenna installations. Refer to "Installing a lightning surge protector (USA)" on page 34.

Before you install an outdoor antenna (USA)

The following figure diagrams all the required hardware for installing outdoor antennas.

Figure 11 Installed antenna and lightning surge protectors (USA)



Before you install an outdoor antenna, check the following points:

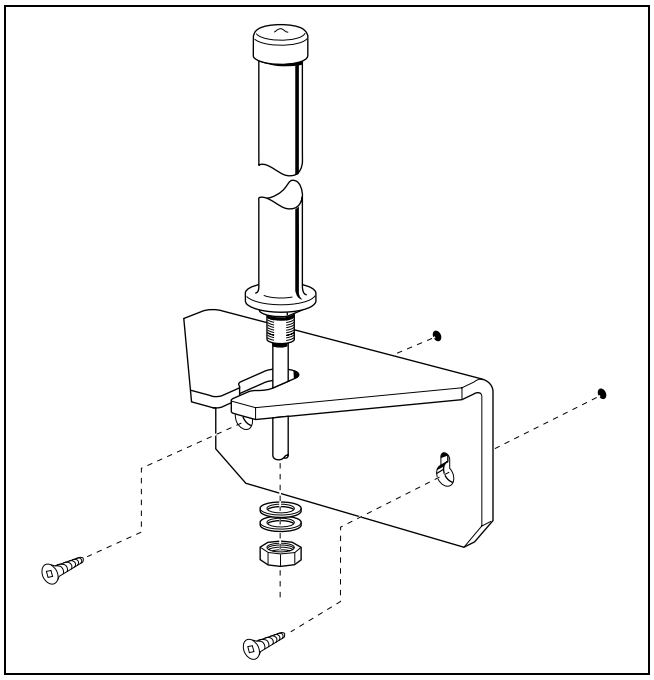
- Locate the antenna on the external wall of the building.
- Keep the outdoor antenna as close as possible to the base station connected to it. The base station must always be inside the building. The recommended installation height for the antenna is 13 to 16 ft. above ground.
- Always install a lightning surge protector between an outdoor antenna and a base station. Refer to the following figure.

Installing an outdoor antenna (USA)

To install an outdoor antenna, follow these steps:

1. Make a hole for the coaxial cable.
2. Install conduit for the antenna cable according to local building and wiring codes.
3. Screw the antenna bracket to the wall so that the antenna is vertical on the exterior wall.
4. Loosen the nut on the antenna.
5. Slide the antenna into the slot of the bracket and tighten the nut. Refer to the following figure.
6. Feed the coaxial cable through the wall to the lightning surge protector on the interior wall.

Figure 12 Antenna with antenna bracket (USA)



Wiring information

- The recommended wire gauge is 6 AWG.
- Connect the ground lead to the building ground. Do not connect to a ground rod or series of ground rods.
- If you cannot connect the ground lead to the building ground, connect the ground lead to the metal frame of the building. The connection must be no more than six to 10 ft.
- You can connect the ground lead to the 120 V ac conduit, which is connected to the building ground. However, using the ac conduit is not the preferred method of installation.
- The connector between the antenna and the lightning surge protector and between the lightning surge protector and the base station is a proprietary BNC connector. You must align the BNC connectors before you can make the connection.

Installing a lightning surge protector (USA)

Install the lightning surge protector to protect the Companion components from electrical surges.

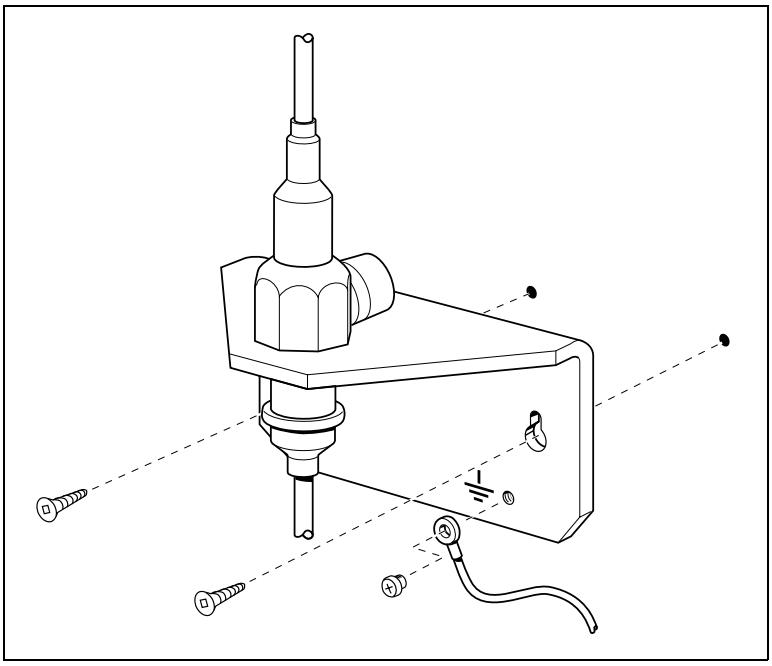
To install a lightning surge protector, follow these steps:

1. Install the lightning surge protector on the interior wall as close as possible to the entry point of the coaxial cable from the outdoor antenna.

   Before you connect the ground lead to the lightning surge protector, attach the ground lead to an approved ground. Refer to the Wiring information tips box on the next page.

2. Route and connect the coaxial cable from the outdoor antenna to the lightning surge protector.

Figure 13 Lightning surge protector and bracket (USA)



3. Route and connect the coaxial cable from the lightning surge protector to the appropriate base station connector. Refer to the following figure.

Installing antennas (Canada)

There are three types of external antennas available in Canada:

- indoor directional antenna ("Installing an indoor directional antenna" on page 36)
- indoor omnidirectional antenna ("Installing an indoor omnidirectional antenna (Canada)" on page 37)
- outdoor omnidirectional antenna ("Installing an outdoor omnidirectional antenna (Canada)" on page 38).

Each type of installation requires a specific installation technique. As well, you must install a lightning surge protector for every outdoor antenna installed ("Installing a lightning surge protector (Canada)" on page 40).

Outdoor requirements

Before you install the antenna, ensure that your plan meets the following requirements:

- If you are installing an outdoor antenna on a metal surface greater than 18 cm (7 in.) in diameter, position the antenna perpendicular to the surface.
- When running the coaxial cable inside or outside, be careful not to damage the cable, which affects its performance. The minimum recommended bending radius is 20 mm (0.8 in.).
- Always ensure that the antenna is clear of any adjacent obstruction or metal objects. If you use more than one outdoor antenna at a cell center, separate the antennas at by least 0.5 m (20 in.) to avoid radio interference problems.
- Use RG-58/U coaxial cables to connect the antennas to the base stations.

CAUTION: Use only passive antennas to connect to the Companion base stations.
The coaxial cable you use to connect the external antenna to a Companion base station must have an impedance of 50 ohms.

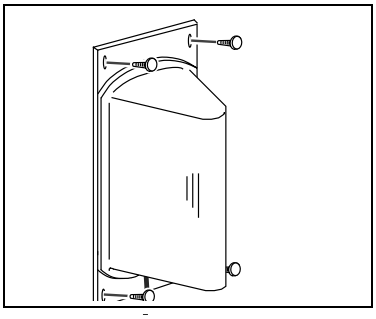
Installing an indoor directional antenna

The indoor directional antenna has a backplate that allows for easy installation on a wall. The antenna is installed half way between the floor and the ceiling.

For some applications (for example, a stairwell), you can install the antenna on the ceiling.

1 Use four screws at each corner of the antenna. Refer to the following figure.

Figure 14 Indoor directional external antenna (Canada)



2 To prevent stress on the coaxial cable, fasten the cable to the mounting surface.

3 Connect the antenna to the appropriate base station radio.

Note: The coaxial cable length must not exceed 10 m (33 ft.).

Installing an indoor omnidirectional antenna (Canada)

To install an indoor omnidirectional antenna, use the following guidelines:

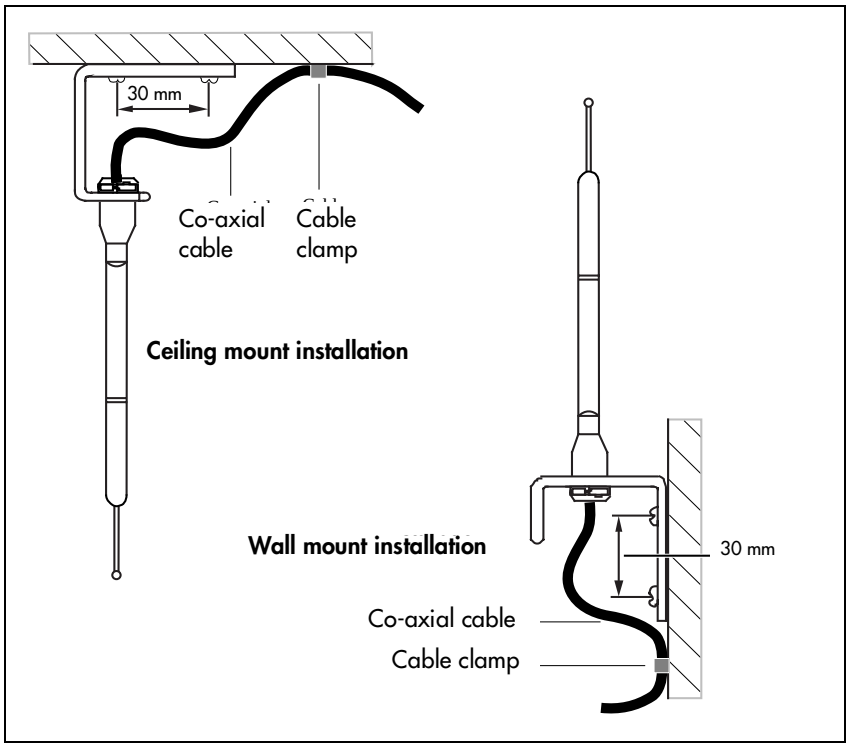
- Use the bracket supplied to install the antenna on a wall or ceiling. This bracket provides the necessary clearance between the floor or wall and the antenna.
- Mount the bracket so that the external antenna is vertical. The recommended installation position on a wall is halfway between the floor and the ceiling.

1. Insert the antenna in the bracket so that the antenna is vertical.
2. Use two screws to install the bracket to the wall or ceiling.
3. To prevent cable stress on the coaxial cable, fasten the cable to the mounting surface with a clamp.
4. Connect the external antenna to the appropriate base station.

   Note: The length of the coaxial cable must not exceed 10 m (33 ft.).

The following figure shows the two methods of installing the indoor omnidirectional external antenna.

Figure 15 Indoor omnidirectional external antenna (Canada)



Installing an outdoor omnidirectional antenna (Canada)

When installing an outdoor omnidirectional external antenna, ensure you follow these guidelines:

- Locate the antenna on the external wall of the building.

  Note: You must install the antenna on a vertical surface.

- Keep the outdoor omnidirectional external antenna as close as possible to the base station. The base station itself must always be located inside the building.
- The recommended installation height is 4 m (13 ft) to 5 m (16.5 ft) above ground level.
- Always install a surface protector between an outdoor omnidirectional external antenna and a base station.

  Note: The connector on the outdoor omnidirectional external antenna is a TNC female connector. To connect the antenna, you need an adapter to connect the TNC connector to the BNC coaxial cables or a coaxial cable with a TNC male connector on one end and BNC male connector on the other end.

Caution: Fit lightning protection to the antenna if appropriate.
See "Installing a lightning surge protector (Canada)" on page 40 for more information.

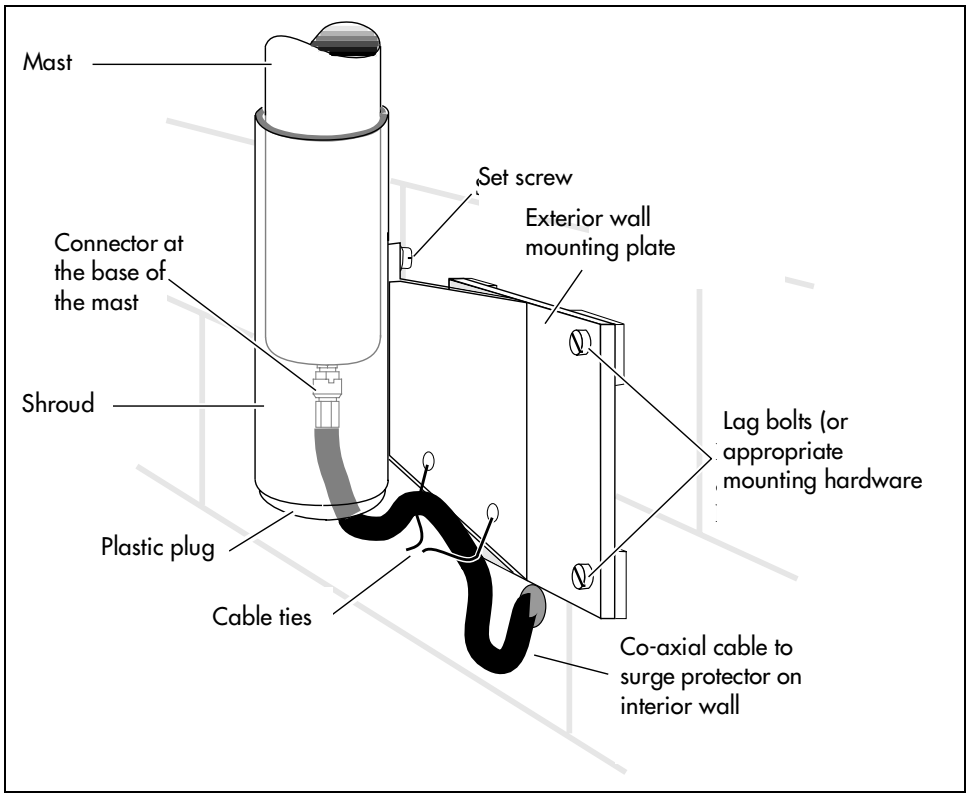
Important points to remember:

- Do not install the external antenna or the lightning surge protector during an electrical storm.
- Always turn off the base station power before connecting the coaxial cable of an outdoor antenna.
- Always install the antenna at the cable entry point into the building.
- Connect the lightning surge protector to ground before connecting the coaxial cable.

To install an outdoor omnidirectional external antenna, follow these steps:

1 Screw the antenna mounting plate vertically to the exterior wall of the building with lag bolts or other appropriate hardware. The following figure shows how to fasten the mounting plate.

Figure 16 Install the outdoor omnidirectional external antenna (Canada)



2 Feed one end of the coaxial cable up through the bottom of the antenna cover and attach the BNC connector to the base of the mast.

3 Slide the mast down into the cover until it fits.

4 Rotate the mast until the threaded hole in the base of the mast aligns with the set screw hole in the cover. Tighten the set screw.

5 Route the coaxial cable along the bottom edge of the plate between the cover and the wall plate.

Note: The total length of the coaxial cables from the outdoor antenna to the base station must not exceed 10 m (33 ft.).

6 Tie the cable to the mounting plate.

7 Insert the plastic plug into the base of the cover to keep moisture out.

8 Feed the coaxial cable through the wall to the surge protector on the interior wall.

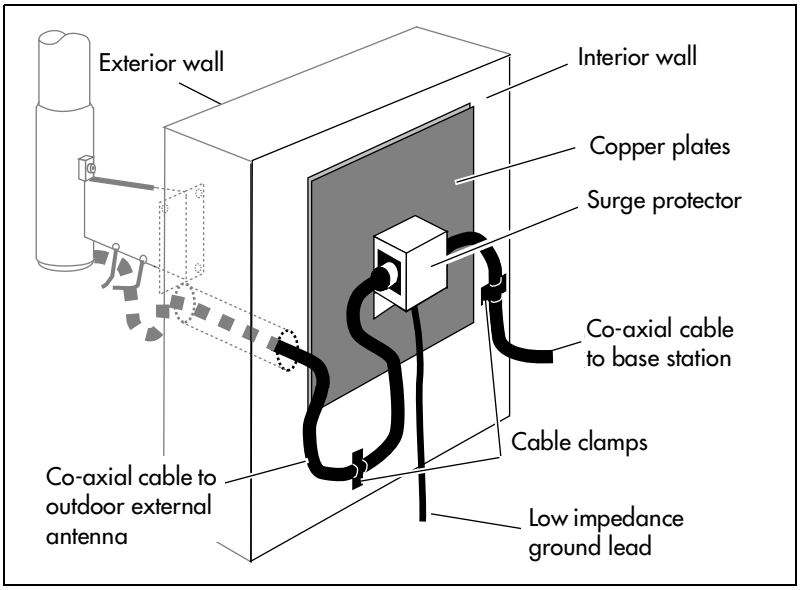
Installing a lightning surge protector (Canada)

Install the lightning surge protector for the outdoor omnidirectional external antenna to protect it from electrical surges. The recommended lightning surge protector is part number A0382082. Refer to the installation instructions from the manufacturer for more details on its installation. To install a lightning surge protector, follow these steps:

1 Install the surge protector on the interior wall as close as possible to the entry point of the coaxial cable from the outdoor antenna.

The following figure shows where to locate the surge protector. Follow the installation instructions provided with the surge protector.

Figure 17 Install the lightning surge protector (Canada)



2 Attach the ground lead to an approved ground, before you connect the ground lead to the surge protector.

The recommended wire gauge is 6 AWG (4 mm). Connect the ground lead to the building ground. Do not connect to a ground rod or series of ground rods. If you cannot connect the ground lead to the building ground, connect the ground lead to the metal frame of the building. The connection must be no more than 2 m (6.5 ft.) to 3 m (10 ft.) long.

You can connect the ground lead to the 120 V ac conduit (which is connected to the building ground). However, Nortel Networks does not recommend using the 120 V ac conduit.

3 Route and connect the coaxial cable from the outdoor antenna to the surge protector.

4 Route and connect the coaxial cable from the surge protector to the appropriate base station BNC connector.

Note: The total length of the coaxial cables from the outdoor antenna to the base station must not exceed 10 m (33 ft.).

Chapter 2
Configuring Companion handsets

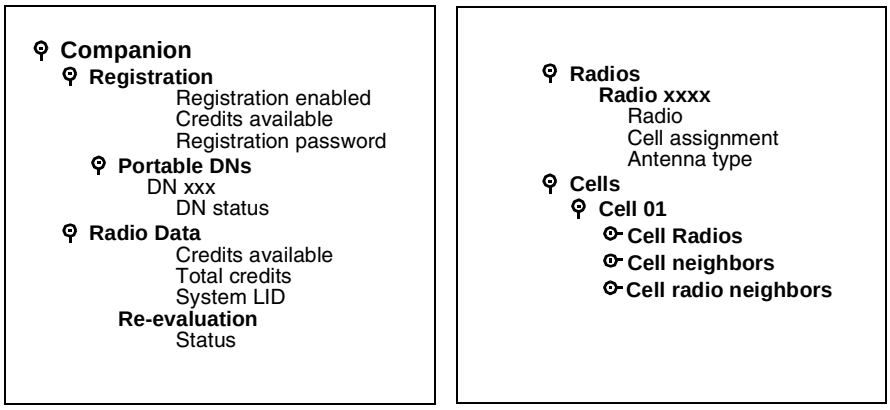
The Companion heading in the Unified Manager allows you to assign Companion portable telephones to the system, check base station parameters, and enable and disable registration through programming.

This section includes information about:

- "Companion overview" on page 42
- "Process map: Companion portable handset" on page 43
- "Defining radio data" on page 44
- "Enabling Companion handset registration" on page 46
- "Using portable DNs to show handset status" on page 47
- "Registering Companion portables" on page 48
- "Deregistering a handset" on page 53
- "Measuring RSSI for the handsets" on page 55
- "Companion DN record parameters" on page 59
- "Handset features and restrictions" on page 60

The following figure shows a detailed view of the Companion headings on the navigation tree.

Figure 18 Companion headings



NOTE: Companion wireless requires a Business Communications Manager keycode to activate.

Companion overview

Companion handsets interact with base stations that are hardwired to the Business Communications Manager through a DTM (digital trunk module) media bay module. These handsets provide you with the mobility to move about your office and continue or initiate conversations as you move about.

Caution: Companion Wireless systems have specific deployment areas and licensing requirements.
They also require a site survey prior to deployment to ensure proper distribution of the base stations around the call site.

The Companion system supports C3050 Etiquette, Companion C3060 Portable, and Companion C3050 CT2Plus handsets. Each handset comes with a user manual that describes the handset operation.

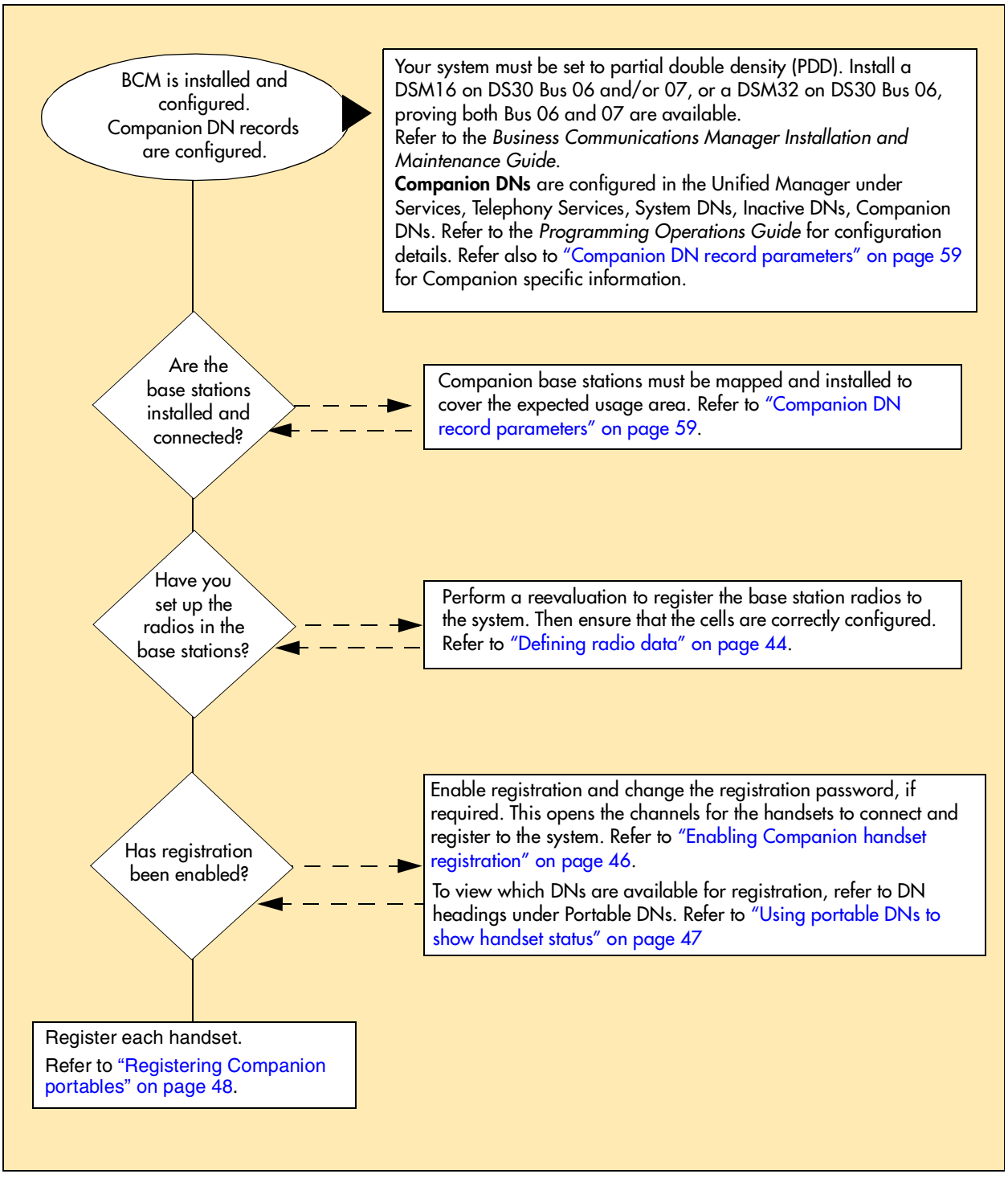
Note: Business Communications Manager software version 2.5 or greater: If your system has a 3/5 DS30 split and Partial Double Density (PDD), you can only add 32 Companion handsets to your system on Bus 06.
Business Communications Manager software version 3.0 or greater: If your system is set to Full Double Density (FDD), Companion is not supported.

Once the handsets and base stations are installed, you configure the handsets through the Business Communications Manager using special Companion DN records.

Process map: Companion portable handset

Refer to the process map below, which leads you through the order for setting up Companion handsets on the Business Communications Manager.

Figure 19 Process map: Setting up Companion handsets for registration


BCM is installed and configured. Companion DN records are configured.
Your system must be set to partial double density (PDD). Install a DSM16 on DS30 Bus 06 and/or 07, or a DSM32 on DS30 Bus 06, proving both Bus 06 and 07 are available. Refer to the Business Communications Manager Installation and Maintenance Guide.
Companion DNs are configured in the Unified Manager under Services, Telephony Services, System DNs, Inactive DNs, Companion DNs. Refer to the Programming Operations Guide for configuration details. Refer also to "Companion DN record parameters" on page 59 for Companion specific information.
Are the base stations installed and connected?
Companion base stations must be mapped and installed to cover the expected usage area. Refer to "Companion DN record parameters" on page 59.
Have you set up the radios in the base stations?
Perform a reevaluation to register the base station radios to the system. Then ensure that the cells are correctly configured. Refer to "Defining radio data" on page 44.
Has registration been enabled?
Enable registration and change the registration password, if required. This opens the channels for the handsets to connect and register to the system. Refer to "Enabling Companion handset registration" on page 46.
To view which DNs are available for registration, refer to DN headings under Portable DNs. Refer to "Using portable DNs to show handset status" on page 47
Register each handset.
Refer to "Registering Companion portables" on page 48.

Defining radio data

The Radio data heading allows you to view the number of credits available, the total number of credits and the System LID.

This section contains the following information:

- "Using Reevaluation to assign cells to base stations" on page 44
- "Programming base station radios" on page 44
- "Defining base station cells" on page 45

Using Reevaluation to assign cells to base stations

Radio re-evaluation automatically assigns the proper cell configuration to each radio in a base station. When you add or remove base stations, you must apply **Reevaluation** to the system.

Follow these steps to apply reevaluation to your Companion system.

1. From **Companion**, click the **Radio data** heading.
   The Radio data window appears.
2. Beside **System SLID**, enter the radio ID.
   On the navigation menu, click on **Re-evaluation**.
   If the Re-evaluation status reads **Required**, you can carry out the re-evaluation.
3. On the **Configuration** menu click **Re-eval now** or **Schedule**.

Programming base station radios

The Radios setting allows you to program base station radio settings.

Follow these steps to define the settings.

1. From **Companion**, click the key beside **Radio data**.
2. Click the key beside **Radios**.
3. Choose a radio number from the list.
4. Use the information in the following table to configure the radio.

Table 9 Radio settings

Attribute	Value	Description
Radio	Read-only identification number	This is the number that identifies the radio base station.
Cell assign	Unassigned Assigned	This box indicates if the cell has been activated.

Table 9 Radio settings (Continued)

Attribute	Value	Description
Antenna type	Internal External	This is the type of antenna the radio base station is connected to.

A cell is the area covered by one or more radios in close proximity. As you move around your office while on a call with your portable, the call hands off from one cell to another. A call on a portable hands off from one cell to another only if Business Communications Manager assigns those cells as neighbors. Business Communications Manager automatically assigns cell neighbors and re-evaluates the cell-to-cell configuration when you add or remove base stations.

Defining base station cells

Cell programming allows you to examine settings for the cell radio, cell neighbor, and cell radio neighbor.

Follow these steps to set up cells for your Companion system.

1. Click on the keys beside **Services, Telephony services**, **Companion**, **Radio data**, **Cells**.
2. Select a cell number (**Cell 01** to **Cell 32**).
3. Use the information in the following table to check cell information.

Table 10 Cell information

Attribute	Value	Description
Cell Radios	<five-digit number>	View the five-digit number of any radios assigned to this cell. For example, if radio 07012 is in the cell, 07012 assigned appears.
Cell neighbors	<two-digit cell number>	View the two-digit number of any cells that border a particular cell in a system. Click the cell number to see the settings: **Assigned** or **Unassigned**. For example, cell 01, Neighbour:03 and Neighbour:04 display. This means that cells 03 and 04 are assigned as cell neighbors.
Cell radio neighbors	<two-digit cell number>	View the two-digit number of any cells that border a particular cell in a system (the cell neighbors) plus any cells that border the cell neighbors. Click the cell number to see the settings: **Assigned** or **Unassigned**. For example, cell 01, Radio neighbour:03, Radio neighbour:04 display, and Radio neighbour:11. Cell 11 does not appear as a cell neighbor, therefore, it must be a neighbor of cell 03 or 04. Refer to the example under Cell neighbor.

Enabling Companion handset registration

The **Registration** heading under **Companion**, provides access to controls to enable you to allow or disallow handset registration. You can also enter or change a registration password, that further protects the system from unauthorized entry. Refer to "Enabling registration or changing the password".

When you enable registration, the **Portable DNs** heading displays the DNs that can be used for the handsets. These DNs are the same as those found under the **Telephony services, System DNs, Active Companion DNs** heading.

Warning: Before you install or move wireless equipment in the United States, check that you have approval from UTAM Inc.

The United States FCC has appointed UTAM Inc. as the body responsible for coordinating and verifying the installation or relocation of unlicensed, personal wireless communication devices. To comply with UTAM Inc., the system uses keys and credits to control user capacity and to ensure system location verification. You require these software keys and credits to activate Companion services. You purchase these credits at the time you place the order.

Enabling registration or changing the password

To enable user registration or to change the password, follow these steps:

Warning: Registration should normally be disabled.
For security reasons, and to prevent unauthorized users from being registered to your system, disable Registration when you have finished registering the portables.

1. Click the keys beside **Services, Telephony Services**, **Companion**.
2. Click on **Registration**.
3. Use the information in the following table to check registration information.

Table 11 Handset registration and password information

Attribute	Value	Description
Registration	Y, N	You must enable registration for the entire Business Communications Manager system to allow registration of individual portables. After you have registered the sets, come back and disable registration by setting this field to N.
Credits available	Read-only.	This field shows the number of credits that are available for handset registration. This number must be any positive number to allow portables to be registered. The number decrements by one with each successful registration. The number increments when a telephone is deregistered. More credits can be added by purchasing additional keycodes.

Table 11 Handset registration and password information (Continued)

Attribute	Value	Description
Registration password	<five digits>	Enter the digital code that needs to be identified on the handset to allow access to the system. This number can be changed, as required.
	Tips: You can choose any combination of one to six digits for the password. It is easier to remember the password if the digits spell a word. Provide this password only to selected personnel, to prevent unauthorized access to programming. The implications of such access can include the rearrangement of line assignments, which can affect the operation of the Business Communications Manager.	

Using portable DNs to show handset status

After you enable registration for your Business Communications Manager system, a series of extension numbers (565 to 596) are automatically available for registration. Check that an extension number is available before registering a portable telephone to it.

To view registered and available DNs:

1. Click on the keys beside **Services, Telephony Services**, **Companion**, **Registration**, **Portable DNs**.
2. Click a portable DN (for example, DN 471).

   The **DN status** box appears.

   - If the extension number shows a status of **Available**, it is ready for registering a Companion portable telephone.
   - If the extension number shows a status of **Registered**, a Companion portable telephone is already registered to that extension number. In this case, you can pick a different extension number, or deregister the current portable telephone. You must perform deregistration both at the portable and from Unified Manager.

Registering Companion portables

Companion portables that are supported on the Business Communications Manager include the C3060, C3050, C3020 (Canada only). They all have different dial pad icons, and the registration procedure is slightly different for each, although the basic procedure is the same:

1 Enter the Registration password on each portable.

2 Verify that the portable operates properly.

Refer to these sections for details about each type of handset:

- "Registering the C3060 handset" on page 48
- "Registering the C3050 handset" on page 50
- "Registering a C3020 handset (Canada only)" on page 52

Notes about registering Companion portables:

- You cannot register a portable to more than one extension number per system.
- You cannot register more than one portable to one extension number.
- You can register a portable to more than one system. If a portable telephone is to be used in more than one Business Communications Manager system, its owner must know which registration slot number was used to register the portable telephone with each system. Nortel Networks recommends that users register their most frequently used system in slot 1.
- If a portable telephone is lost or broken, deregister it from the system before replacing it with another portable telephone. Refer to "Deregistering a handset" on page 53.

Registering the C3060 handset

To register each portable with Business Communications Manager:

1 Ensure that registration is enabled. Refer to "Enabling Companion handset registration" on page 46.

2 Press the following keys, in sequence: **MENU*****.

The display shows `ADMINISTRATION`.

3 Press the display key under `SYS`.

The display shows `WIRELESS SYSTEMS`.

Note: Wireless Systems is a registration list of names for up to six different systems. If the list is full, you need to de-register an existing system name to add a new one.

4 Press `ADD` to establish a radio link.

Note: If `ADD` does not display, start over at step 1.

The display briefly shows `Adding SYSTEM:` <next available system number>.

- If the display shows `No connection`, the radio link was not established.

  Note: If more than 30 minutes has elapsed since the last handset registration, you may need to re-enable the system for registration. Return to step 1.
- If a radio link is established, the display shows `Pswd:`.

5 Enter the registration password.

The display shows `WTN:`

Note: If you enter the wrong password, the display shows `Invld Pswd`.

6 Enter the DN record number you want to assign to this handset.

The display shows `Enter name`.

- If the display shows `Invld WTN`, then you entered an invalid DN.
- If the display shows `Reg failed`, the handset failed to register to the system.
- If you try to register a handset to the same system more than one, the display shows the registered name (`Registered as` <name>).

7 Using the dialpad, enter a maximum of 16 characters for the system name.

- More than one letter is represented by most dialpad keys. Press the key the number of times it takes to display the letter you want.
- Press `SPACE` to add a blank space to the name.
- Press `BKSP` to delete the previous character.
- Press the right arrow button if the next letter is on the same button.

8 Press `SAVE`.

The display shows the registered name.

9 Turn off registration for your system.

Confirm that the handset is registered

Make this simple test to confirm that the handset registered to the system.

1 From the `WIRELESS SYSTEMS` list, ensure the system you just entered is displayed.

2 Power off the handset.

3 Power on the handset.

- If the handset displays the correct system name proceed with the next step.
- If an incorrect system name displays, return to the `WIRELESS SYSTEMS` list and use the up and down arrow keys to find the correct system name.

4 Make a call.

- If you hear dial tone and the display shows LINK, dial the number of a working telephone. If the target telephone rings, registration is confirmed.
- If you do not hear dial tone, check that you have selected the correct system or re-register the handset.

5 Receive a call.

Note: If the portable has the same DN as a desk telephone, ensure that the desk telephones is idle and Call Forward is deactivated. Ensure that the ringer on the handset is turned on.

- On another telephone in the system, dial the telephone of the registered portable. If the portable rings, registration is confirmed.
- If the portable does not ring or you do not hear dial tone on the portable, refer to the Companion handset user guide for troubleshooting tips or contact system technical support.

Registering the C3050 handset

1 Ensure that registration is enabled. Refer to "Enabling Companion handset registration" on page 46.

2 Open the handset flap.

The portable displays the current system name or `No system selected` for two seconds.

3 Press the key labeled **System**.

The display shows `WIRELESS SYSTEMS`.

Note: This handset can be registered for a maximum of nine systems.

4 Press `ADD` to establish a radio link.

Note: If `ADD` does not display, start over at step 1.

The display briefly shows `Adding SYSTEM:#`<next available system number>.

- If the display shows `No connection`, the radio link was not established.

  Note: If more than 30 minutes has elapsed since the last handset registration, you may need to re-enable the system for registration. Close the flap and return to step 2.

- If a radio link is established, the display shows `Pswd:`.

5 Enter the registration password.

The display shows `DN:`

Note: If you enter the wrong password, the display shows `Invld Pswd`. In this case, close the flap and repeat from step 2.

6 Enter the DN record number you want to assign to this handset.

The display shows `Enter name`.

- If the display shows `Invld DN`, then you entered an invalid DN.
- If the display shows `Reg failed`, the handset failed to register to the system.
- If you try to register a handset to the same system more than one, the display shows the registered name (`Registered as` <name>).

7 Using the dialpad, enter a maximum of 16 characters for the system name.

- More than one letter is represented by most dialpad keys. Press the key the number of times it takes to display the letter you want.
- Press SPACE to add a blank space to the name.
- Press BKSP to delete the previous character.
- Press the right and left arrow buttons to move forward and back.

8 Press SAVE.

The display shows the registered name.

9 Turn off registration for your system.

Confirm that the handset is registered

Make this simple test to confirm that the handset registered to the system.

1 Close, then open the portable flap.

- If the handset displays the correct system name proceed with the next step.
- If an incorrect system name displays, return to the WIRELESS SYSTEMS list and use the up and down arrow keys to find the correct system name.

2 Make a call.

- If you hear dial tone and the display shows LINK, dial the number of a working telephone. If the target telephone rings, registration is confirmed.
- If you do not hear dial tone, check that you have selected the correct system or re-register the handset.

3 Receive a call.

Note: If the portable has the same DN as a desk telephone, ensure that the desk telephones is idle and Call Forward is deactivated. Close the handset flap and ensure that the ringer on the handset is turned on.

- On another telephone in the system, dial the telephone of the registered portable. If the portable rings, registration is confirmed.
- If the portable does not ring or you do not hear dial tone on the portable, refer to the Companion handset user guide for troubleshooting tips or contact system technical support.

Registering a C3020 handset (Canada only)

The following section describes the procedures involved in registering Companion C3020 portable telephones.

1. Ensure that registration is enabled. Refer to "Enabling Companion handset registration" on page 46.
2. Press **Shift** and then press **Memory**.
3. Press **Office**.
4. Check the portable display.
   - If the portable has space for another system, the display shows `Office n:Free`.
   - If the display does not show `Office n:Free`, follow the procedures in to overwrite the system number. Then return to this procedure and perform the following step.
5. Press **Shift** and then press **Memory**.

   The display shows `Registering ...`, then `Pswd`:
6. Enter the Registration password.
7. When the display clears and displays `DN:`, enter the DN for the handset.

   The display clears and shows `Reg'n complete`.
8. Turn off registration for your system.

Confirm that the handset is registered

Make this simple test to confirm that the handset registered to the system.

1. Make a call.
   - If you hear dial tone, dial the number of a working telephone. If the target telephone rings, registration is confirmed.
   - If you do not hear dial tone, check that you have selected the correct system or re-register the handset.
2. Receive a call.

   Note: If the portable has the same DN as a desk telephone, ensure that the desk telephones is idle and Call Forward is deactivated. Ensure that the handset flap is closed and the ringer on the handset is turned on.
   - On another telephone in the system, dial the telephone of the registered portable. If the portable rings, registration is confirmed.
   - If the portable does not ring or you do not hear dial tone on the portable, refer to the Companion handset user guide for troubleshooting tips or contact system technical support.

When you distribute the portables, tell the users that the portables are registered and give them the corresponding extension numbers.

Deregistering a handset

Deregister an extension number from Unified Manager when:

- You must replace the portable due to loss or breakage.
- You want to assign the handset to a user with a different telephone number.

This section contains the following information:

- "Deregistering a portable from the system" on page 53
- "Deregistering a C3060 handset" on page 54
- "Deregistering a C3050 handset" on page 54
- "Deregistering a C3020 handset" on page 55

Deregistering a portable from the system

This procedure only clears the portable registration on the system. You must also deregister from the portable telephone ("on-the-air" deregistration). For information about deregistering your portable telephone, refer to the next section and the *Companion Portable Telephone User Guide.*

1. Click the keys beside **Services, Telephony services**, **Companion**, **Registration**, **Portable DNs**.
2. Click a portable DN (for example, **DN 471**).
   The DN status window appears.
3. On the **Configuration** menu, click **Deregister**.

   Note: This procedure does not clear the registration data in the portable. You must also deregister from the portable telephone ("on-the-air" deregistration).
   For information about deregistering your portable telephone, refer to your *Companion Portable Telephone User Guide.*

Deregistering a C3060 handset

This procedure only clears the registration information on the portable. You must also deregister the portable from the system. Refer to "Deregistering a portable from the system" on page 53.

1. Press the following keys, in sequence: **MENU*****.

   The display shows ADMINISTRATION.

2. Press the display key under SYS.

   The display shows WIRELESS SYSTEMS.

   Note: Find the system name on the list using the up and down arrow keys.

3. Press ERASE.

   The display shows Erase item?

4. Press OK.

   The display shows Deregistering ..., and then Item erased.

Deregistering a C3050 handset

This procedure only clears the registration information on the portable. You must also deregister the portable from the system. Refer to "Deregistering a portable from the system" on page 53.

1. Open the flap of the handset.
2. Press the key labeled **System**.

   The display shows WIRELESS Systems.

3. Using the up and down arrow keys, find the system name on the list using the up and down arrow keys.
4. Press ERASE.

   The display shows Erase item?

5. Press OK.

   The display shows Deregistering ..., and then Item erased.

Deregistering a C3020 handset

This procedure only clears the registration information on the portable. You must also deregister the portable from the system. Refer to "Deregistering a portable from the system" on page 53.

1. Press **Shift**, and then **Memory**.
2. Press **Office**.

   The display shows `Office n:`.
3. Press either **Shift** and then **#**, or **Shift** and then ***** until you display the system you want to deregister.
4. Press **Shift**, and then **0**.

   The display shows `Deregister?`
5. Press **Shift** and then **0** again.

   The display shows `Deregistering ...` and then `Deregistered`.
6. To continue using the portable, press **Release**.

Measuring RSSI for the handsets

The Receive Signal Strength Indicator (RSSI) is a measurement of the signal strength the Base Station receives from the portable. The Base Station controls the power transmitting mode of the portable.

- **Measuring undirected RSSI for handsets:**

  When the Base Station receives a weak signal, it instructs the portable to transmit in high-power. When the Base Station receives a strong signal, it instructs the portable to transmit in low-power.

  — C2060: Strongest RSSI value = -35 dBm. Weakest RSSI value = approximately -94 to -100 dBm. ("Measuring undirected RSSI for C3060 handsets" on page 56)

  — C2050: Strongest RSSI value = `-45` dBm (USA)/`-44` dBm (Canada). Weakest RSSI value = approximately `-94` to `-100` dBm. ("Measuring undirected RSSI for C3050 handsets" on page 57

  — C2030: Strongest RSSI value = -44 dBm. Weakest RSSI value = approximately -85 to -95 dBm. ("Measuring undirected RSSI for C3020 handsets" on page 58)

  Note: The Receive Signal Strength indicator overrides normal display. Therefore, you cannot receive calls while measuring RSSI.

- **Measuring directed RSSI for handsets:**

  You may want to measure the RSSI between a portable and a specific Base Station radio. For example, you may suspect that one of the two radios in a Base Station is not working properly. You can also use directed RSSI to prevent hand-off while you find a cell edge. To measure the RSSI of a specific radio, you must be in range of two Base Stations—the one you want to measure and another Base Station.

Note: You cannot measure the directed RSSI of both radios in the Base Station at the same time.

Before you measure directed RSSI, note the following:

— The five-digit ID of the Base Station radio you want to measure, by mapping the Base Station location to the TCM port. The first four digits indicate the TCM port to which the Base Station is connected. The last digit indicates the number of the radio on the Base Station. For example, the number 03142 on the Base Station is connected to TCM port 0314, and 2 is the radio number. The five-digit number might be printed on a label attached to the Base Station mounting bracket.

— The radio IDs of all other Base Stations in the same location.

Measuring undirected RSSI for C3060 handsets

1 Press the **Menu** button.

The display shows `MENU`.

2 Press the up and down arrow keys until the display shows `Feature request`.

3 Press `SELCT`.

The display shows `A-`.

4 Press *** 8 9 8**.

The display shows the cell number, the radio ID of the Base Station to which the portable is linked, the power mode (high or low), followed by the signal strength and the channel. For example, `8 15112 H 67 29`.

Hand-off occurs normally between the cells.

Note: In this example, the cell is 8, the card is 15, the port is 11, the radio is 2, and the channel is 29. The signal strength measured by the Base Station is -67 dBm, and the H indicates the portable is transmitting in high-power mode (an L indicates low-power mode)

5 Power off the handset to end the connection.

Measuring directed RSSI for C3060 handsets

1 Follow steps 1 to 5 of “Measuring undirected RSSI for C3060 handsets”.

- If the display shows the ID of a Base Station neighboring the one you want to measure, proceed to the next step.
- If the display shows the ID of the Base Station you want to measure, move out of the cell boundary range so that handoff occurs and then continue with the next step.

2 Press the **Menu** key.

The display shows `MENU`.

3 Press the up and down arrow keys until the display shows `Feature request`.

4 Press SELCT.

The display shows A-.

5 Press *** 8 9 9**.

6 Enter the five-digit ID code for the Base Station radio you want to measure. The display shows the cell number, the radio ID of the Base Station to which the portable is linked, the power mode (high or low), followed by the signal strength and the channel. For example, 8 15112 H 67 29.

Hand-off does not occur as you move between the cell boundaries. The link drops when you move out of range.

Note: In this example, the cell is 8, the card is 15, the port is 11, the radio is 2, and the channel is 29. The signal strength measured by the Base Station is -67 dBm, and the H indicates the portable is transmitting in high-power mode (an L indicates low-power mode).

7 To end the connection, press the **Menu** button.

Measuring undirected RSSI for C3050 handsets

1 Open the flap on the handset.

2 Press the **Line** key.

3 Press *** 8 9 8**.

The portable displays the radio ID of the Base Station to which the portable is linked, followed by the signal strength and the power mode, for example 03142 - 54 H.

Hand-off occurs normally between the cell boundaries.

In this example, the module is 03, the port is 14, and the radio is 2. The signal strength measured by the Base Station is -54 dBm, and the H indicates that the portable is transmitting in high-power mode (an L indicates low-power mode).

4 Close the connection. Press **End** or close the flap.

Measuring directed RSSI for C3050 handsets

1 Follow steps 1 to 3 in the section "Measuring undirected RSSI for C3050 handsets".

2 When the portable displays the Base Station ID you want to measure, move out of the cell boundary range so that hand-off occurs, and then press **End**.

3 Press **Line**.

4 Press ***899**.

5 Enter the five-digit ID code for the Base Station radio you want to measure.

The portable displays this ID followed by the signal strength and the power mode, for example 03142 - 54 H. Hand-off does not occur as you move between the cell boundaries. The link drops when you move out of range.

In this example, the module is 03, the port is 14, and the radio is 2. The signal strength measured by the Base Station is -54 dBm, and the H indicates the portable is transmitting in high-power mode (an L indicates low-power mode).

6 Press **End** or close the flap to disconnect.

Measuring undirected RSSI for C3020 handsets

1 Press **Line**. Wait for dial tone.

2 Press *** 8 9 8**.

The display shows the radio ID of the Base Station to which the portable is linked, followed by the signal strength, for example 03121 - 67.

In this example, the module is 03, the port is 12, and the radio is 1. The signal strength is -67dBm.

Hand-off occurs normally.

3 Press **Release** or close the flap to end the connection.

Measuring directed RSSI for C3020 handsets

1 Follow steps 1 to 3 in the section "Measuring undirected RSSI for C3020 handsets".

2 Press ***899**.

3 Enter the five-digit ID code for the Base Station radio you want to measure.

The display shows this ID followed by the signal strength, for example 03121 - 67. If you have not established a connection with the desired Base Station radio, you hear a tone when you hold the portable to your ear.

The system drops the link when you move out of range of your Base Station (no hand-off).

4 Press **Release** or close the flap to disconnect.

Companion DN record parameters

Companion DNs are programmed in the same way as other Business Communications Manager telephones. However, some programming settings do not affect the operation of the portable.

The following table shows the recommended settings for using Companion on the Business Communications Manager. For detailed telephone configuration information refer to the *Programming Operations Guide*.

Table 12 Companion telephone programming

Programming level	Programming option	Setting	Notes
System DNs..., DN XXX, Line access	Answer DNs	<set DN>	This is the number of the stationary telephone that is twinned with the handset. When the stationary telephone gets a call, the Companion mirrors the call.
System DNs..., DN XXX, Capabilities	Forward no answer	Fwd to: <DN> Fwd Delay: <no. of rings>	This stops the Companion portable from ringing when the call is forwarded to its new destination. The portable user can still answer the call, but it does not ring. The settings for Forward no answer are found under **System DNs/Active Companion DNs/DN##/ Capabilities** in the Unified Manager.
	Forward on busy	Y	
	Do not disturb on busy	N	
	Handsfree	N	
	Handsfree answerback	None	
	Pickup group	<group number>	A portable can be part of a pickup group and answers calls ringing at telephones in the same group when the user enters FEATURE 76.
	Paging	Y	
	Page zone	1	
	Direct dial	Set 1	A portable cannot be a Direct dial telephone. It can use the Direct dial digit.
	Hotline	None	
	Priority call	Y	Requires special configuration of hardware and programming
System DNs.../DN XXX/Restrictions/ Set Restrictions	Set lock	Y	Does not apply to portables.
	Allow last number	Y	Does not apply to portables.
	Allow saved number	Y	Does not apply to portables.
	Allow link	Y or N	This can be set to N for portables.

Handset features and restrictions

Your Companion cordless telephone system uses multiple base stations to provide full coverage around your office.

As you move from one part of your office to another, your call passes from one base station to the next.

- In rare instances, during a Message session, softkey display prompts on your portable may disappear. This is a normal condition and is improved by staying within range of a base station.
- While you are moving within range, you may hear a slight clipping during a call. Clipping occurs as a call is handed off from one base station to the next.
- Problems with lost connections are rare, but if you notice an increase in occurrences, your base stations may need to be moved or reprogrammed. Contact your installer to change the base station configuration. (In the U.S. you need to obtain UTAM Inc. approval before making changes to the base station configuration for Companion systems.) For more information, refer to *Business Communications Manager Programming Operations Guide*.

  Note: If you try to send a message from a desk telephone to a portable telephone, the display of the desk telephone shows `Can't send msg`.

If there is a decrease in voice quality while you are moving with a portable telephone, you may be moving out of range from a system base station. There are three possible reasons for this:

- The base station that covers the area you are moving into is busy or unable to pick up your call.
- Large pieces of furniture or movable partitions block the signal between you and the base station.
- You have moved out of the range covered by your system. To reconnect, retrace your steps until you are back in range.

Feature access for Companion

It is possible to use many of the same system features available to a Business Communications Manager telephone on your cordless telephone. For more information about features and the special codes required to use them, refer to the feature card that came with your portable telephone. The following table describes the Business Communications Manager call features that the Companion can access.

Table 13 Features available to a Companion portable handset

Feature	Description
Call Forward	Send calls to another telephone in your system. The display does not indicate that calls are being forwarded. Hunt Group calls override all Call Forward features. A Hunt Group extension can be a Call Forward destination.
Call Information	The display shows the name or extension of an internal caller. If your system is equipped to receive CLASS information (Caller ID), the external call information appears on the display.
Call Park	Park a call.
Call Park Retrieval	Retrieve a parked call.
Cancel Call Forward	Cancel the Call Forward feature, where calls are automatically sent to another telephone in the system.
Conference	Create a three-way call.
Directed Call Pickup	Answer any telephone that is ringing in the system. This feature must be enabled in the system.
Group Pickup	Answer a call ringing on another set within the same pickup group.
Host system signaling	Use link and pause.
Line Pool	Use line pools the same way a desk telephone does.
Mute	Prevent other callers from hearing you. Also, you can mute incoming calls from ringing on a portable telephone.
Page	Page an individual telephone, several telephones, external speakers, or the entire system. A Hunt Group extension cannot be in a page zone. Note: Portable handsets cannot receive pages.
Pause	Program an external autodial sequence to insert a 1.5 second delay.
Prime line	This may be either an Intercom Line, an Assigned Line or a Line Pool. Handsets without line buttons cannot have a Prime Line assigned.
Privacy	In programming, change the privacy setting for an external line assigned to the portable. This does not give the ability to change the privacy setting on a call by call basis.
Release	End a call or programming session.
Speed Dial	System speed dial codes only. No personal speed dial codes. The portable directory can store up to 50 telephone numbers.
Switching between two calls	Put one call on hold and speak to another caller.
Transfer	Transfer a call to another telephone.
Transfer using directory	Transfer a call using your portable telephone directory.
Trunk Answer	Answer a ringing call for lines placed in a Service Mode.

Table 13 Features available to a Companion portable handset (Continued)

Feature	Description
Wireless Portable Language Selection	Change the language of the prompts that appear on the portable telephone display. Refer to “Language selection”.
Wireless Call Forward No Answer	Forward a call without ringing. The portable user can answer a call but it does not ring.

Language selection

The system supports a primary default language and up to three alternate languages, depending on the system profile.

Press **501	Language - Primary
Press **502	Language - Alternate
Press **503	Language - Alternate 2
Press **504	Language - Alternate 3

Index

A

administration/maintenance tools 14

antenna
- Canada, installation 35
- certification 30
- Co-axial cable, maximum length 37
- directional, installation 36
- external 31, 38
- external installation 30
- indoor 37
- indoor directional external antenna, installation 36
- indoor installation 36
- indoor omni-directional external antenna, installation 37
- installation restrictions 35
- installation strategy 32
- Lightning surge protector 40
- lightning surge protector 35
- maximum length cable 40
- omni-directional 37, 38
- outdoor omni-directional external antenna, installation 38
- passive 35
- positioning 35
- proprietary extension cable 30
- RG-58A U coaxial cables 30
- U.S. installation 31

antenna type, Companion 44

B

backup power, RPI 16

base station 14
- clearances 27
- connecting plug-top power supply 28
- distances 25
- hand-off 25
- indoor antenna 36
- installation 25
- maximum cable 19
- minimum distances 26
- omnidirectional outdoor antenna 38
- positioning 14, 26
- powering up 29
- proprietary extension cable 30
- RG-58/U coaxial cable 35
- RG-58A U antenna cable 30
- TCM connections 27
- termination board 27
- turn off power 30
- U.S. installation 31
- updating software 29
- wiring length, power 19
- wiring RPI 19

BNC connector 31, 33, 40

bracket terminal board 27

BS-1 download 29

C

cables
- maximum distance 19

call
- switching between 61

Call Forward
- cancel, Companion 61
- Companion 61
- no answer, Companion 62

Call information
- Companion 61

Call Park
- Companion 61
- retrieval, Companion 61

cell
- assignment, Companion 44
- neighbors, Companion programming 45
- radio neighbor, Companion 45
- radios, Companion 45

channel split
- Companion 14

channel split limitations 14

clearances, Companion base station 27

clipping 60

coaxial cable 30, 35, 40

Companion
- antenna type 44
- C3050 Etiquette 14
- C3050, CT2Plus 14
- C3060 14
- cell assignment 44
- cell neighbors 45
- cell radio neighbor 45
- cell radios 45
- disabling registration 46
- double density 42
- enable handset registration 46

enabling registration 46
external antenna 38
handset credits 46
handset models 42
handset status 47
licensing 42
lightning surge arrestor 34
radio ID 44
recommended settings 59
register handset 46
registration password 47
UTAM approval 46

Companion 3020 14

Companion Base Station, see base station

Companion software 14

components
RPI 18

conference
Companion 61

copyright 2

cordless telephones
Companion 60
DECT 60
features 61

coverage area, maximum 14

credits, Companion handset 46

D

DECT
cordless handsets 60
handset models 42
licensing 42

diagnostic software 14

Directed Pickup
Companion 61

directional antenna 36

disable
handset registration 46

E

enable
handset registration 46

extensions
portable telephones 29

external antenna 31

external antennas 38

F

FCC
certification, antennas 30

FDD
Companion 42

feature
cordless telephones 61
wireless Call Forward No Answer 62
wireless Portable Language Selection 62

Federal Communications Commission, see FCC

G

Group Pickup
Companion 61

H

hand-off, Companion base station 25

handsets
registering 46
status, Companion 47

host system signaling
Companion 61

Hunt groups
Companion 61

I

illustration 40

indoor antenna 36, 37

input wiring 22

install
base station 27
Companion 13
lightning surge protector 40

L

language
Companion 62

licensing
Companion and DECT 42

lightning protector, installation 30

lightning surge arrestor 31
installation 31
installation in Canada 40
installation in U.S. 34

lightning surge protector 35

limitations

channel split 14
Line pool
using, Companion 61
lost calls, troubleshooting 60

M

minimum distances, Companion base station 26
mute
Companion 61

N

NetVision
handsets 42

O

obstructing antennas 35
omnidirectional antenna 37, 38
out of range 60
outdoor antennas 30

P

page
Companion 61
passive antenna 35
password
Companion 47
Pause
Companion 61
PDD
Companion 42
plug-top power supply on base station 28
polarity, TCM connections 27
portable handsets 42
Business Communications Manger features 61
Companion components 44
Companion password 47
using 60
voice quality 60
Portable Language Selection 62
portable telephone
Companion 14
Companion installation 29
DN range 29
extension numbers 29
registration 29
positioning
antenna 35
Companion base station 26
power
Companion RPI
power supply
RPI 16
powering up base station 29
prime line
Companion 61
Privacy
Companion 61
process map
configuring lines 43
programming the Companion 14
proprietary extension cable 30
PSU, RPI requirements 17

R

radio ID 44
range 60
re-evaluation, see Companion programming 44
register handset 29
registration, Companion 46, 48
regulatory information 2
release
using, Companion 61
Remote Power Interconnect, see RPI
restrictions
antenna installation 35
RG-58/U coaxial cable 35
RG-58A U coaxial cables 30
RJ11 jacks 27
RPI
backup power requirements 16
cabling distance 19
clearance 17
components 18
connecting 20
input connectors 21
input wiring 22
installation 16
maximum cable 19
mounting 17
opening 18
output connectors 21
overheating 17
power supply 16
requirements 17

RPI-16 BIX UL 16
RPI-16 BIX wiring chart 24
RPI-8 BIX UL 16
RPI-8 BIX wiring chart 22
turn off before connecting 27
ventilation 17
wiring 19
input connections 21
output connections 21
wiring charts 22

S

softkey display prompts, troubleshooting 60
speed dial
Companion 61
surge arrestor, Companion (U.S.) 34
surge protector 35
proprietary extension cable 30
warning 30
wire gauge 33
surge protectors 30
switching between calls
Companion 61

T

T7406 42
TCM connections, base station 27
telephones
adding wireless units 13
trademarks 2
transfer
Companion 61
troubleshooting
decrease in voice quality 60
lost calls 60
softkey display prompts 60
trunk answer
Companion 61

U

uninterruptible power supply (see UPS)
UPS, RPI 16
UTAM approval 25
UTAM messages 29
UTAM, Companion keyword 46

V

voice quality 60

W

wire color 22
wire gauge, surge protector 33
wireless
adding to system 13
base station installation 25
registering handsets, Companion 29
wiring
RPI 19